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FLOOD INSURANCE STUDY



**TOWNSHIP OF VICTOR,
MICHIGAN**
CLINTON COUNTY



FEBRUARY 2, 1989



Federal Emergency Management Agency

COMMUNITY NUMBER - 260720

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

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Looking Glass River

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Flood Insurance Rate Map

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FLOOD INSURANCE STUDY

TOWNSHIP OF VICTOR, CLINTON COUNTY, MICHIGAN

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study investigates the existence and severity of flood hazards in the Township of Victor, Clinton County, Michigan, and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood risk data for various areas of the community that will be used to establish actuarial flood insurance rates and assist the community in its efforts to promote sound floodplain management. Minimum floodplain management requirements for participation in the National Flood Insurance Program are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the State (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for this study were performed by the U.S. Geological Survey (USGS) (the Study Contractor) for the Federal Emergency Management Agency (FEMA), under Inter-Agency Agreement No. EMW-85-E-1823. This study was completed in November 1986.

1.3 Coordination

An initial meeting was held on February 27, 1985, to determine the streams to be studied. Representatives of the Michigan Department of Natural Resources, FEMA, the USGS, and the Township of Victor were represented at the meeting.

On January 25, 1988, the results of this Flood Insurance Study were reviewed and accepted at a final coordination meeting attended by representatives of the Study Contractor, FEMA, and the community.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the incorporated area of the Township of Victor, Clinton County, Michigan. The area of study is shown on the Vicinity Map (Figure 1).

Flooding caused by overflow of the Looking Glass River was studied in detail.

Approximate analyses were used to study those areas having a low development potential or minimal flood hazards.

The areas studied were selected with priority given to all known flood hazard areas and areas of projected development or proposed construction through November 1991. The scope and methods of study were proposed to and agreed upon by FEMA and the Township of Victor.

2.2 Community Description

The Township of Victor is on the eastern edge of Clinton County, in the central part of the lower Michigan peninsula. Victor is bordered on the east by the Village of Laingsburg and the Townships of Woodhull and Sciota, on the south by the Township of Bath, on the west by the Township of Olive, and on the north by the Township of Ovid. The Township of Victor is served by Conrail. The 1980 population of Victor was reported to be 2,287 (Reference 1).

2.3 Principal Flood Problems

Flooding in the Township of Victor is due primarily to overflow of the Looking Glass River, which flows from east to west through the southern half of the township. Some flooding also occurs along the Little Maple River, Vermilion Creek, Alder Creek, and Holden Drain.

2.4 Flood Protection Measures

Flood protection measures are not known to exist within the study area.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude that is expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10-, 2-, 1-, and 0.2-percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long-term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the

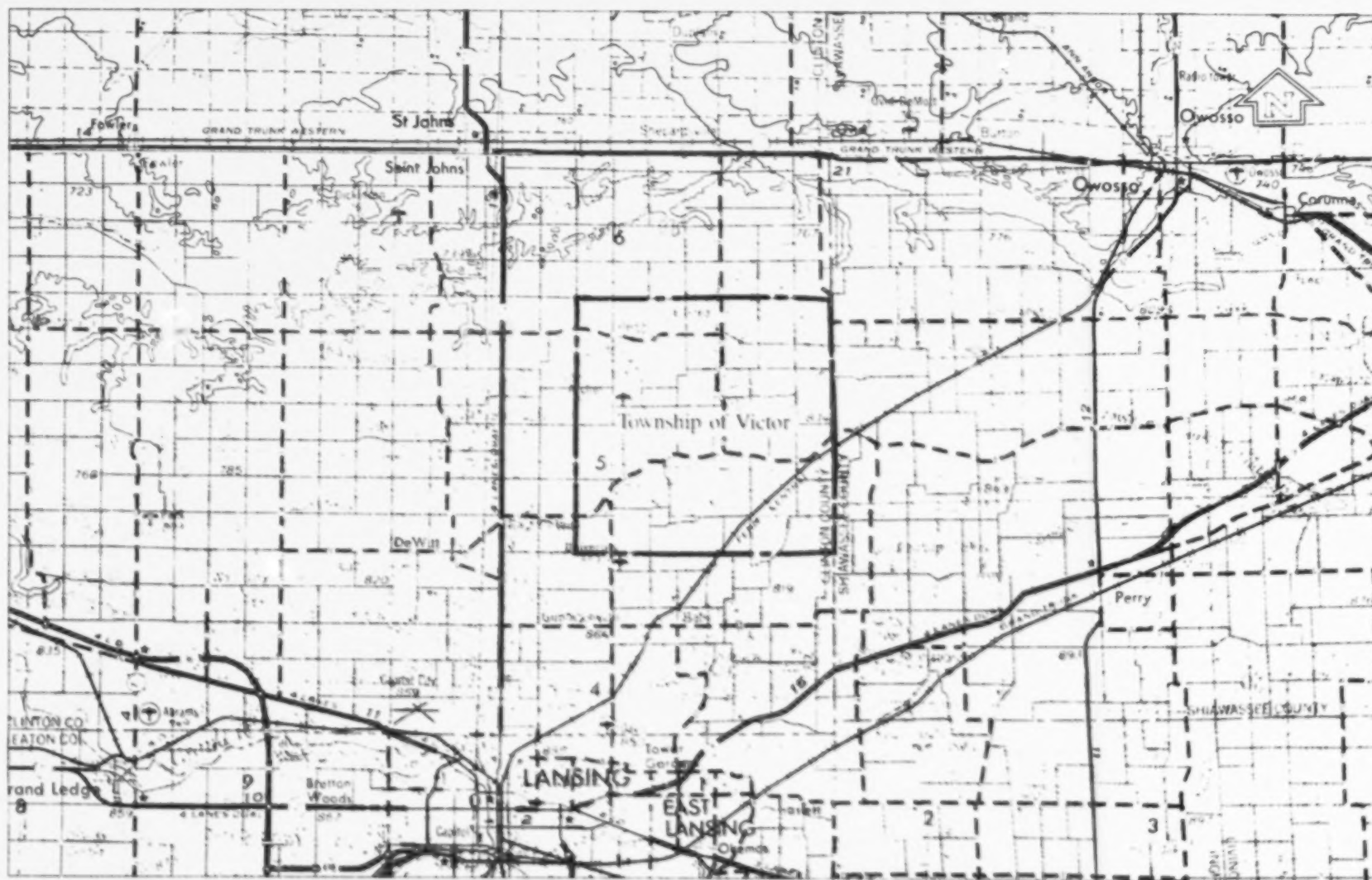


FIGURE 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWNSHIP OF VICTOR, MI
(CLINTON CO.)

APPROXIMATE SCALE



VICINITY MAP

same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood that equals or exceeds the 100-year flood (1-percent chance of annual exceedence) in any 50-year period is approximately 40 percent (4 in 10), and, for any 30-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for each riverine flooding source studied in detail affecting the community.

Analyses of 41 years of streamflow record available for USGS gaging station no. 04114500 were used to estimate flood-frequency magnitude relationships (Reference 2).

Peak discharge-drainage area relationships for the 100-year flood of each flooding source studied in detail in the community are shown in Table 1.

TABLE 1 - SUMMARY OF DISCHARGES

<u>FLOODING SOURCE AND LOCATION</u>	<u>DRAINAGE AREA (SQ MILES)</u>	<u>PEAK DISCHARGE (CFS*) 100-YEAR</u>
LOOKING GLASS RIVER at USGS gaging station no. 04114500	180	3,480

*cubic feet per second

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals.

The HEC-2 step-backwater computer program was used to determine the 100-year flood elevations (Reference 3). Cross sections were taken by field survey.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles and on the Flood Insurance Rate Map.

The slope-conveyance method was used to determine the starting water-surface elevations.

Flood profiles were drawn showing the computed water-surface elevations for floods of the selected recurrence intervals. In cases where the 50- and 100-year flood elevations are close together, due to limitations of the profile scale, only the 100-year profile has been shown.

The hydraulic analyses for this study are based only on the effects of unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

All elevations are referenced to the National Geodetic Vertical Datum of 1929 (NGVD). Elevation reference marks used in this study are shown on the map and described in the exhibit labeled Elevation Reference Marks.

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The National Flood Insurance Program encourages State and local governments to adopt sound floodplain management programs. Therefore, each Flood Insurance Study provides 100-year flood elevations and delineations of the 100- and 500-year floodplain boundaries and 100-year floodway to assist communities in developing floodplain management measures.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1-percent annual chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2-percent annual chance (500-year) flood is employed to indicate additional areas of flood risk in the community. For each stream studied in detail, the 100- and 500-year floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:24000 with a contour interval of 10 feet (Reference 4).

The 100-year floodplain boundaries are shown on the Flood Insurance Rate Map. On this map, the 100-year floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A, AE, AH, AO, A99, V, and VE). Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

For the streams studied by approximate methods, only the 100-year floodplain boundary was delineated using the Flood Hazard Boundary Map for the Township of Victor, Michigan (Reference 5).

4.2 Floodways

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 100-year flood can be carried without substantial increases in flood heights.

Floodways have not been shown or computed for this community. Along streams where floodways have not been computed, the community must ensure that the cumulative effect of development in the floodplain will not cause an increase in the base flood elevations greater than the State's allowable surcharge at any point within the community.

5.0 INSURANCE APPLICATION

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base flood elevations or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by detailed methods. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 100-year floodplain, areas of 100-year flooding where average depths are less than 1 foot, areas of 100-year flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 100-year flood by levees. No base flood elevations or depths are shown within this zone.

6.0 FLOOD INSURANCE RATE MAP

The Flood Insurance Rate Map is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 100-year floodplains that were studied by detailed methods, shows selected whole-foot base flood elevations or average depths. Insurance agents use the zones and base flood elevations in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols the 100- and 500-year floodplains, the floodways, and the locations of selected cross sections used in the hydraulic analyses and floodway computations.

7.0 OTHER STUDIES

This Flood Insurance Study supersedes the previously printed Flood Hazard Boundary Map for the Township of Victor (Reference 5).

8.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting the Natural and Technological Hazards Division, FEMA, 300 South Wacker Drive, Chicago, Illinois 60606.

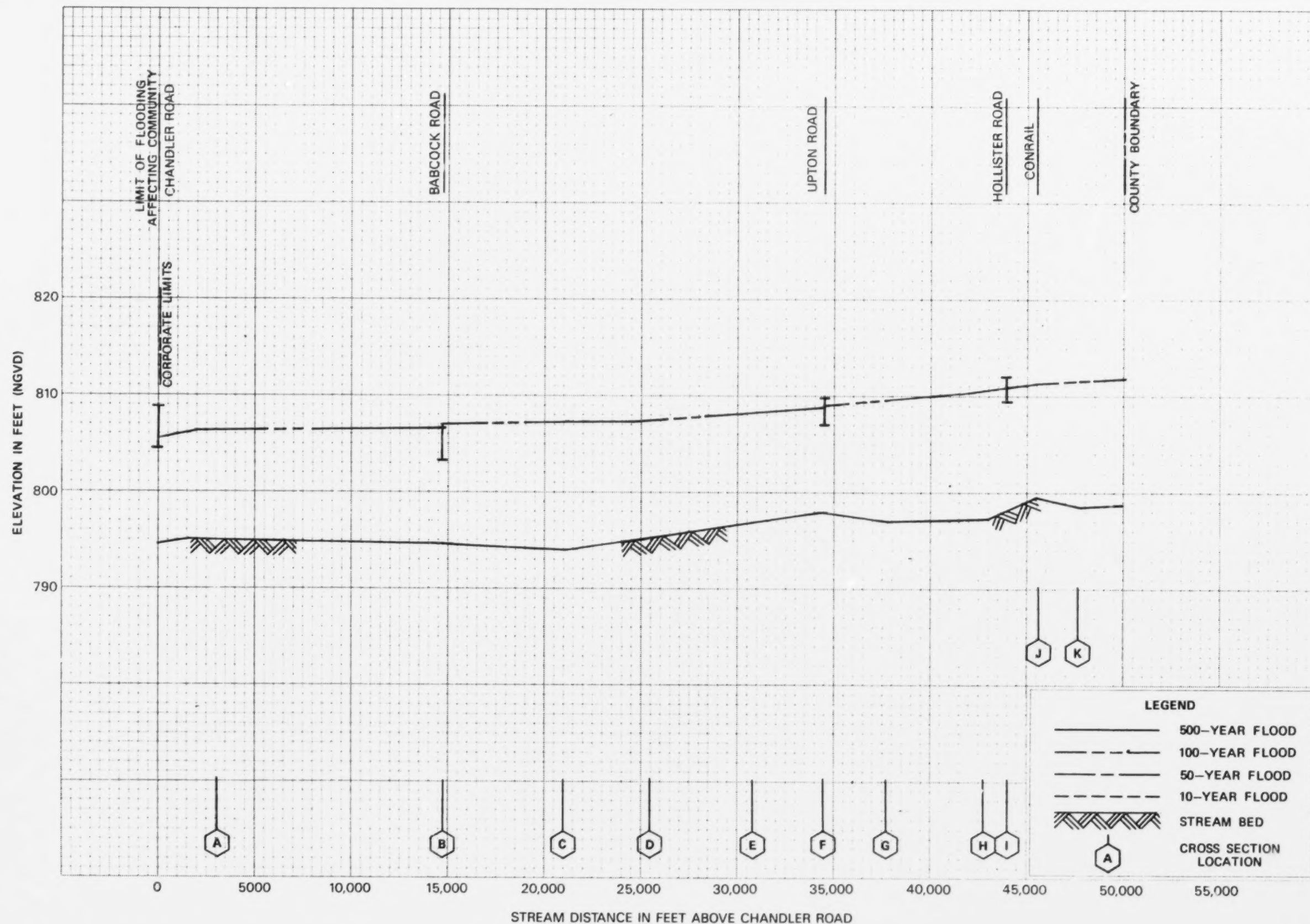
9.0 REFERENCES AND BIBLIOGRAPHY

1. U.S. Department of Commerce, Bureau of the Census, 1980 Census of Population, Number of Inhabitants, Michigan, Washington, D.C., January 1982.
2. U.S. Department of the Interior, Geological Survey, Interagency Advisory Committee on Water Data, Office of Water Data Coordination, Hydrology Subcommittee, Bulletin No. 17B, Guidelines for Determining Flood Flow Frequency, September 1981, revised March 1982.
3. U.S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-2 Water-Surface Profiles, Generalized Computer Program, Davis, California, April 1984.
4. U.S. Geological Survey, 7.5 Minute Series Topographic Maps, Scale 1:24000, Contour Interval 10 Feet: Bath, Michigan, 1972.
5. Federal Emergency Management Agency, Flood Hazard Boundary Map, Township of Victor, Clinton County, Michigan, October 1981.

ELEVATION REFERENCE MARKS

<u>REFERENCE MARK</u>	<u>FLOOD INSURANCE RATE MAP PANEL</u>	<u>ELEVATION (FEET NGVD)</u>	<u>DESCRIPTION OF LOCATION</u>
1	0010	809.77	U.S. Army Corps of Engineers brass disk set in northeast wingwall of Chandler Road bridge over the Looking Glass River
2	0010	802.39	U.S. Army Corps of Engineers brass disk set in southeast headwall of Babcock Road bridge over the Looking Glass River
3	0010	810.71	U.S. Army Corps of Engineers brass disk set in northwest wingwall of Upton Road bridge over the Looking Glass River
4	0010	809.04	U.S. Army Corps of Engineers brass disk set in northeast wingwall of Hollister Road bridge over the Looking Glass River
5	0010	809.41	an iron in monument located about 5 feet southwest of southwest corner of east wingwall of Conrail bridge over the Looking Glass River
6	0010	833.05	standard iron post with bronze cap stamped "17 RS 1920 MICH 833" located in northwest corner of intersection of Alward Road and Meridian Road
7	0010	809.16	nail in northeast side of telephone pole located in southwest corner at intersection of Ballantine Road and Babcock Road
8	0010	806.88	top of 1-inch square wooden hub driven at base of south side of arrow sign post located on north side of tee intersection of Ballantine Road and Watson Road

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FLOOD PROFILES

LOOKING GLASS RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWNSHIP OF VICTOR, MI
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